

Claims

- [c1] 1.A method for scanning specimens using an optical imaging system and a scanning stage, comprising the steps of:
- calibrating the scanning stage by obtaining and storing height values Z at different calibration positions X , Y of the scanning stage, and thereby generating a height profile of the scanning stage;
 - scanning specimens, and thereby
 - determining a reference height Z_{ref} of the specimen at the beginning of a specimen scan,
 - traveling to specimen points X_p , Y_p using the scanning stage,
 - setting, while traveling to specimen point X_p , Y_p , a specimen height position Z_p pertinent to the respective specimen point X_p , Y_p , the specimen height position Z_p being determined from the reference height Z_{ref} and the height profile of the scanning stage, and
 - acquiring an image and/or performing a measurement at specimen point X_p , Y_p .
- [c2] 2.The method as defined in Claim 1, wherein images of the specimen are acquired by means of a camera, and/or

measurements on the specimen being made by means of an optical measurement device, at specimen points X_p, Y_p .

[c3] 3.The method as defined in Claim 1, wherein the reference height Z_{ref} of the specimen is identified at the beginning of the specimen scan by focusing with a focusing system at a reference location X_{ref}, Y_{ref} of the specimen.

[c4] 4.The method as defined in Claim 1, wherein upon calibration of the scanning stage, the height values Z are obtained by focusing with a focusing system.

[c5] 5.The method as defined in claim 1, wherein during the specimen scan, the image is acquired and/or the measurement is made without stopping the scanning stage at the specimen point X_p, Y_p .

[c6] 6.The method as defined in one of the foregoing claims, wherein with specimen points X_p, Y_p arranged line-by-line, the specimen points X_p, Y_p are scanned in meander fashion.

[c7] 7.The method as defined in claim 1, wherein the height values Z identified at the calibration positions X, Y are stored in a lookup table.

- [c8] 8.The method as defined in claim 1, wherein the specimen height positions Z_p at the specimen points X_p, Y_p are determined, by interpolation or mathematical approximation functions, from the height profile of the scanning stage.
- [c9] 9.The method as defined in Claim 7, wherein if the calibration positions X, Y and specimen points X_p, Y_p are coincident, the specimen height position Z_p is determined from the corresponding height value Z from the lookup table, and the reference height Z_{ref} .
- [c10] 10.The method as defined in claim 1, wherein for calibration of the scanning stage, a flat substrate is placed onto the scanning stage.
- [c11] 11.The method as defined in claim 1, wherein the optical imaging system is a microscope.
- [c12] 12.The method as defined in claim 1, wherein the optical imaging system is a macroscope.
- [c13] 13.The method as defined in claim 3, wherein the focusing system is an LED or laser autofocus system.
- [c14] 14.The method as defined in claim 2, wherein an image field of the camera and the spacings of the specimen points X_p, Y_p are selected in such that an image of the

entire specimen results when the images of all the specimen points X_p , Y_p are juxtaposed.

[c15] 15. An apparatus for scanning specimens using an optical imaging system and a scanning stage, comprises:

- a control unit for displacing the scanning stage, to at least one calibration position X , Y during a calibration of the scanning stage in order to obtain a height profile of the scanning stage; to specimen at least one specimen point X_p , Y_p during scanning of the specimen; and for setting a specimen height position Z_p at each specimen point X_p , Y_p ;

- a memory for storing the height profile of the scanning stage;

- a computation unit for determining the specimen height position Z_p at the respective specimen points X_p , Y_p from a reference height Z_{ref} of the specimen and from the height profile of the scanning stage; and

- an optical device for acquiring data at each specimen point X_p , Y_p .

[c16] 16. The apparatus as defined in Claim 15, wherein the optical device is a camera for acquiring images at each specimen point X_p , Y_p

[c17] 17. The apparatus as defined in Claim 15, wherein the optical device is an optical measurement device for per-

forming a measurement at specimen points X_p, Y_p .

- [c18] 18. The apparatus as defined in Claim 15, wherein a focusing system is provided at least for focusing onto at least one reference location X_{ref}, Y_{ref} in order to obtain a reference height value Z_{ref} .
- [c19] 19. The apparatus as defined in one of Claim 15, wherein the optical imaging system is a microscope.
- [c20] 20. The apparatus as defined in one of Claim 15, wherein the optical imaging system is a macroscope.
- [c21] 21. The apparatus as defined in Claim 17, wherein the measurement device is an optical spectrometer, an ellipsometer, or a layer thickness measurement system.